SECNAV INSTRUCTION 5200.40

Navy

Modeling and Simulation

Verification, Validation, and Accreditation

Background

Department of Defense

INSTRUCTION

NUMBER 5000.61

…DoD Components shall:

Establish VV&A policies, procedures, and guidelines for M&S applications and their associated data.

….

Department of Defense

INSTRUCTION

NUMBER 5000.59

…DoD Components shall:

a. Assist, as appropriate and able within their resource constraints, in the development, revision, and budget

execution of the DoD MSMP and MSIP.

….

Secretary of the Navy

INSTRUCTION

NUMBER 5200.38

…Department of the Navy Modeling and Simulation Program guidance amplifies other existing regulations which govern the design, development, application and disposition of software, including modeling and simulation applications.

….

Secretary of the Navy

INSTRUCTION

NUMBER 5000.2B

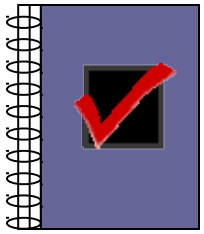
Purpose. To issue mandatory procedures for Department of the Navy (DON) implementation of… major and non-major defense acquisition programs and major and non-major information technology (IT) acquisition programs.

….

SECNAVINST 5200.40

Establishes VV&A Policy

Assigns VV&A Responsibilities



Establishes VV&A Procedures

DON M&S VV&A Policy

All M&S within scope shall be verified, validated, and accredited prior to use

Any subsequent use in a new application domain or modification of the M&S requires a re-accreditation

DON M&S VV&A process is flexible

DON M&S VV&A Responsibilities

Three Branches of Responsibility

- Those responsible for the policy and policy guidance
- Those responsible for ensuring implementation the policy
- Those responsible for implementing the policy

Responsible for policy and policy guidance

NAVMSMO
Navy Modeling & Simulation Management Office

NO PICTURE AVAIL

CAPT Richard Bump
Director

Jim Weatherly
Deputy Director

Jennifer Park
VV&A PM

- Develop training program for accreditors
- Ensure archiving of VV&A activities, plans, and reports
- Conduct annual assessment of VV&A implementation activities
- Support the DON M&S VV&A process
- Serve as technical advisor and M&S repository manager for VV&A
- Conduct periodic technical exchanges within navy M&S development and user communities

Responsible for ensuring implementation of the policy

ASN (RD&A)

Hon. John J. Young Jr.

- DON Acquisition Executive (NAE)
- Responsible for ensuring all M&S employed throughout acquisition process have undergone appropriate VV&A

CNO/CMC

ADM Vern Clark
CNO

Gen. James L. Jones
CMC

- Accredit, in accordance with the instruction, models and simulations they employ as tools in meeting their assigned responsibilities

COMOPTEVFOR/ MCOTEA

RADM Robert E. Besal
COMOPTEVFOR

NO PICTURE AVAIL

Col. John Garvin
MCOTEA

- Accredit all models and simulations used to supplement OT&E

Responsible for implementing policy

Program Executive Officers (PEOs)
Commanders of systems of commands (SYSCOMs)
Direct Reporting Program Managers (DRPMs)
Program Managers (PMs)

- Accredit, in accordance with the instruction, models and simulations they employ as tools in meeting their assigned responsibilities

M&S Proponent

- Develop V&V plan and ensure accreditation authority accredits prior to use
- Implement V&V plan and forward plan, reports, and accreditation to DON M&S repository
- Prepare V&V report and forward to accreditation authority
- Ensure effective configuration management

M&S Accreditation Authority

- Determine the appropriateness of the application of a M&S for a particular use
- Ensure adequate V&V procedures have been implemented prior to the use of M&S

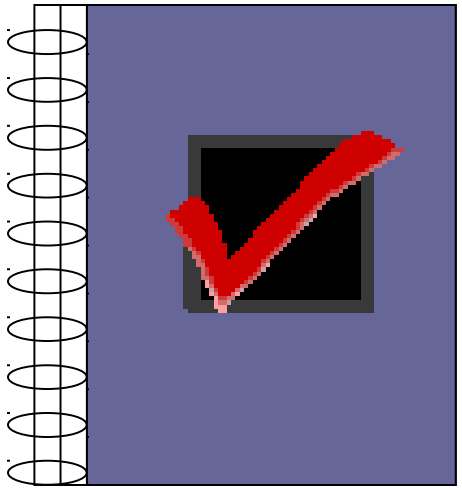
USD (A&T) MSEAs

MSEA
Ocean

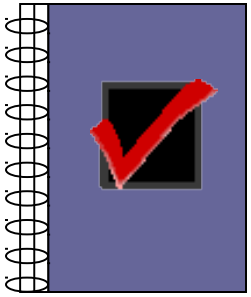
- Responsible to establish appropriate VV&A procedures for M&S under their purview

Delegating Responsibility

- Policy assigns responsibilities to senior ranking staff
- Real-world implementation of VV&A delegated to appropriate VV&A agents/agent-organizations

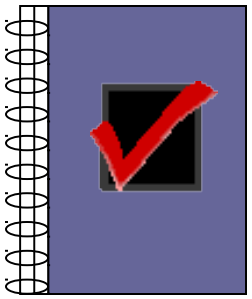


DON M&S VV&A Procedure



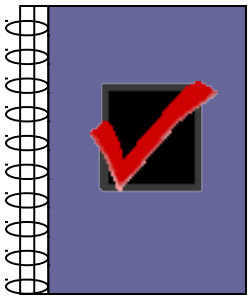
V&V Process Overview

- Preliminary Activities
- Conceptual Validation
- V&V Plan
- Functional Design Verification
- System Verification
- Results Validation



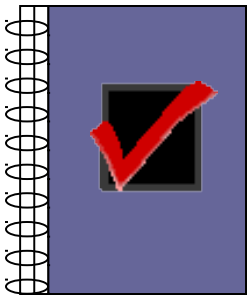
V&V Preliminary Activities

- Fully understand the M&S development requirements
- Set of user-defined acceptability criteria



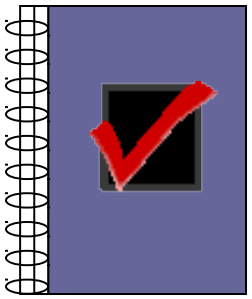
Conceptual Validation

- A [documented] statement of assumptions, algorithms, and architecture that relates the elements of the model to one another
- Validation…explains why [above] are expected to provide an acceptable representation of the subject modeled for the intended application of the model or simulation.



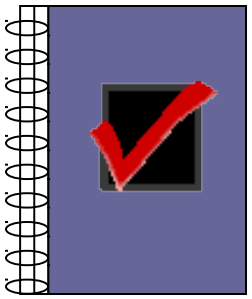
V&V Plan

- Focus of plan is to satisfy VV&A requirements
- Tailor selection of techniques and processes based on requirements and resource availability
- Reviewed and updated as appropriate



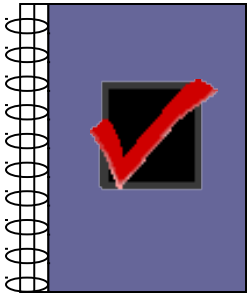
Functional Design Verification

- Based on the M&S system specification, which defines the hardware, software, and personnel that comprise the M&S
- M&S functional design is verified against the conceptual model to ensure it accurately reflects the validated concept.



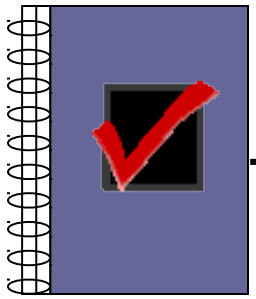
System Verification

- Formal test/review process by the M&S proponent responsible for determining that the M&S accurately represents the functional design and has traceability to the conceptual model
- Examines timing and protocol constraints



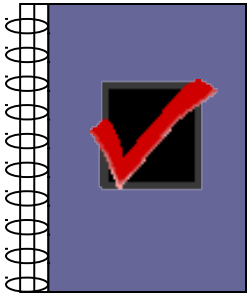
Results Validation

- The formal test/review process that compares the responses of the M&S with known or expected behavior from the subject it represents
- Ascertains that M&S responses are sufficiently accurate for intended use



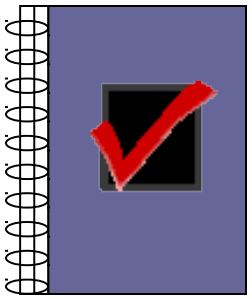
Accreditation Process Overview

- Accreditation Package Development
- Accreditation Package Review
- Accreditation Decision
- Accreditation Status Statement



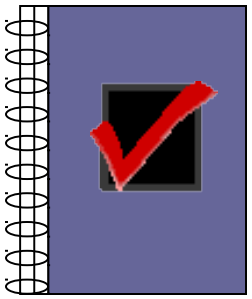
Accreditation Package Development

- Compiled by the M&S proponent
- Commensurate with the purpose for which the accreditation is being sought
- Submitted to the accreditation authority
- References to materials in package should be included in M&S repository



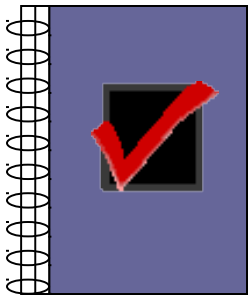
Accreditation Package Review

- Authority may delegate review functions to accreditation agent, DONMSMO, or both
- Authority may also require independent tests be conducted
- Accreditation agent must produce a report which documents the review



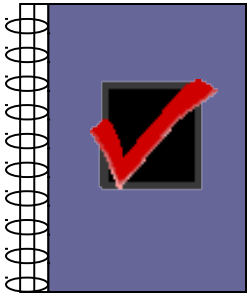
Accreditation Decision

- Respond in the following manner:
  - Accredit M&S
  - Require additional tests or information
  - Disapprove accreditation



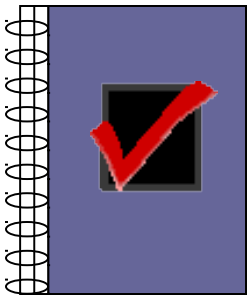
Accreditation Status Statement

- All documents which contain results from an M&S application should contain a statement as to the accreditation status of the M&S application utilized



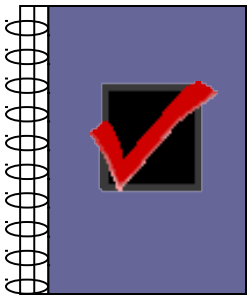
VV&A Documentation Process

- V&V Plan
- V&V Reports
- Independent V&V Reviews and Tests
- Accreditation Reports
- M&S User Support Documents
- Configuration Management Documents
- Data



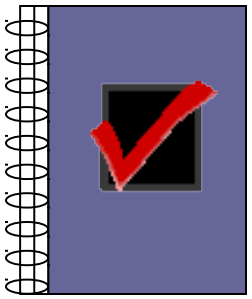
V&V Plan

- Written plan…detailing procedures for verification and validation of M&S application.
- Specific to application



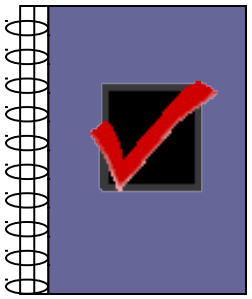
V&V Report

- Identification of V&V agent and any experts who participated in V&V efforts
- Description of M&S
- V&V methodologies
- Document actions taken as a result of V&V
- Document results of V&V efforts



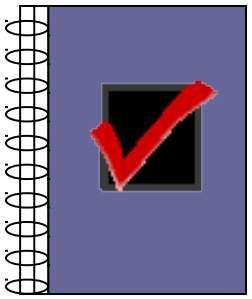
Independent V&V

- Optional, unless they are directed by the M&S proponent, accrediting authority, or higher authority



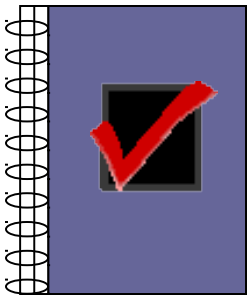
Accreditation Reports

- Identify accreditation authority and agent
- Description of M&S
- Assumptions, scenarios, tactics, etc used in the M&S
- Agent’s evaluation of capabilities and limitations of M&S
- Accreditation authorities decision



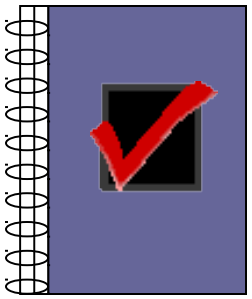
M&S User Support Documents

- M&S design documents
- User’s guide
- Analyst’s manual



Configuration Management Documents

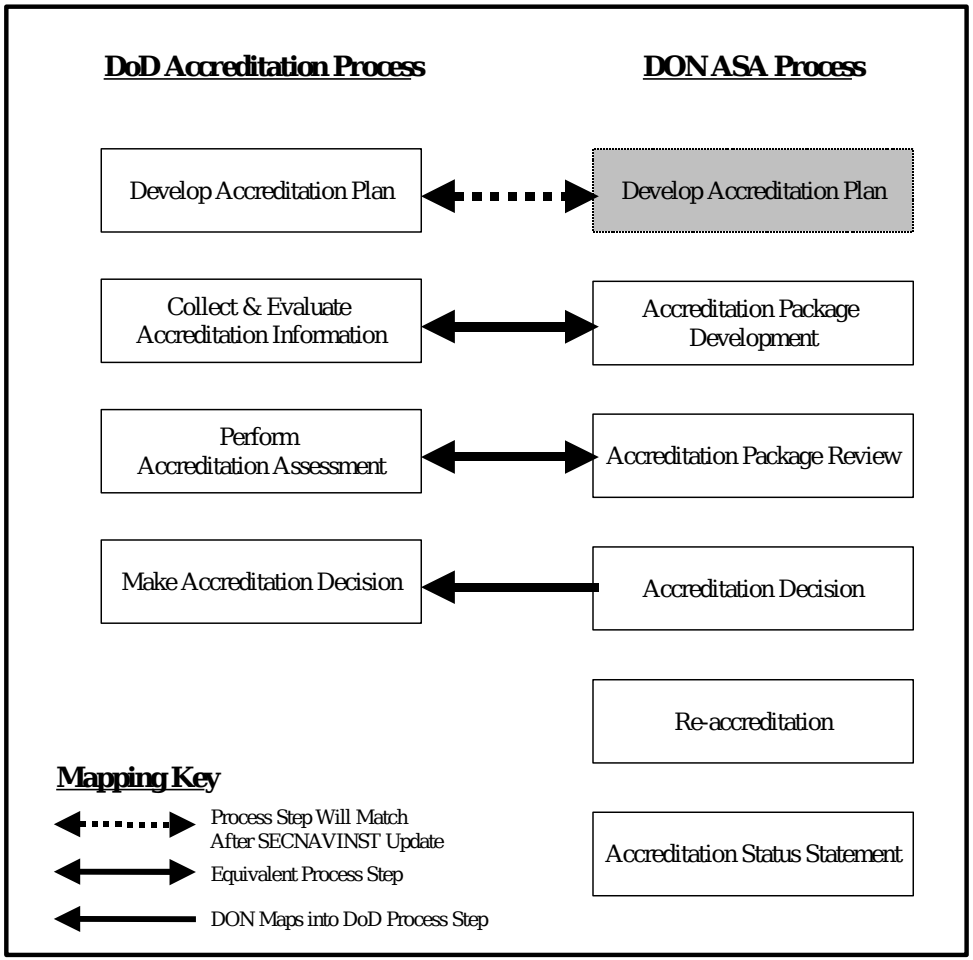
- Responsibility of M&S proponent
- Required for any M&S undergoing accreditation



Documentation Templates

- Contained in DON M&S VV&A Implementation Handbook Appendices

Comparison of Navy VV&A Process with DoD



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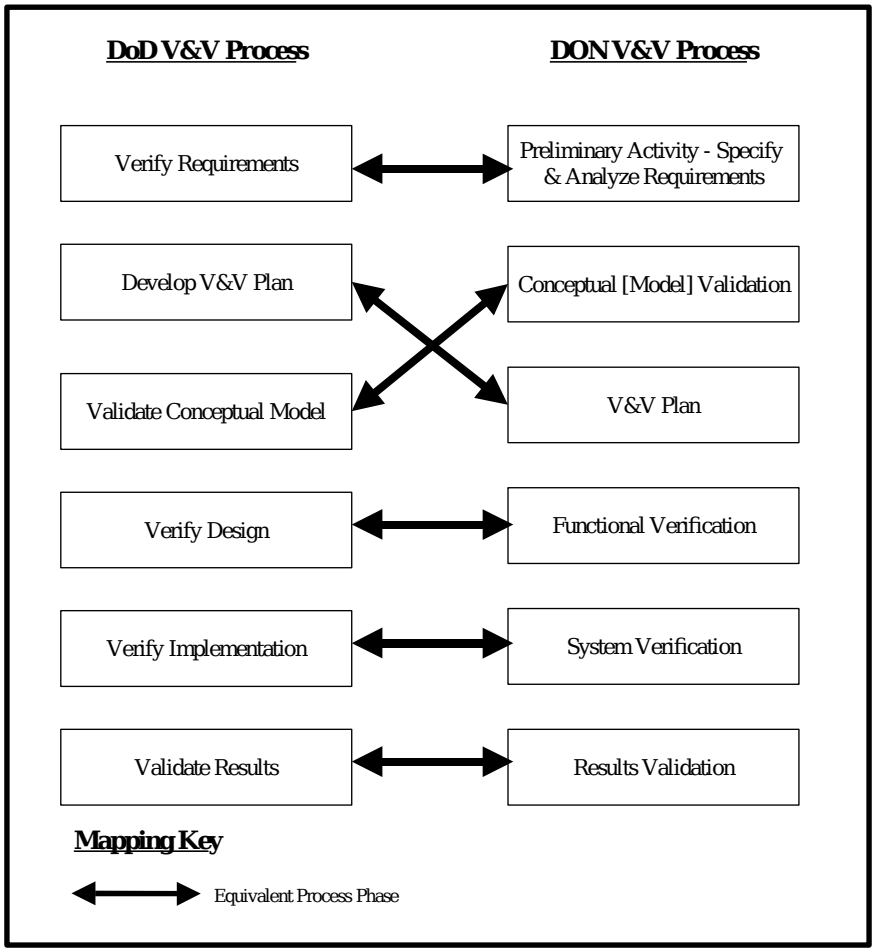

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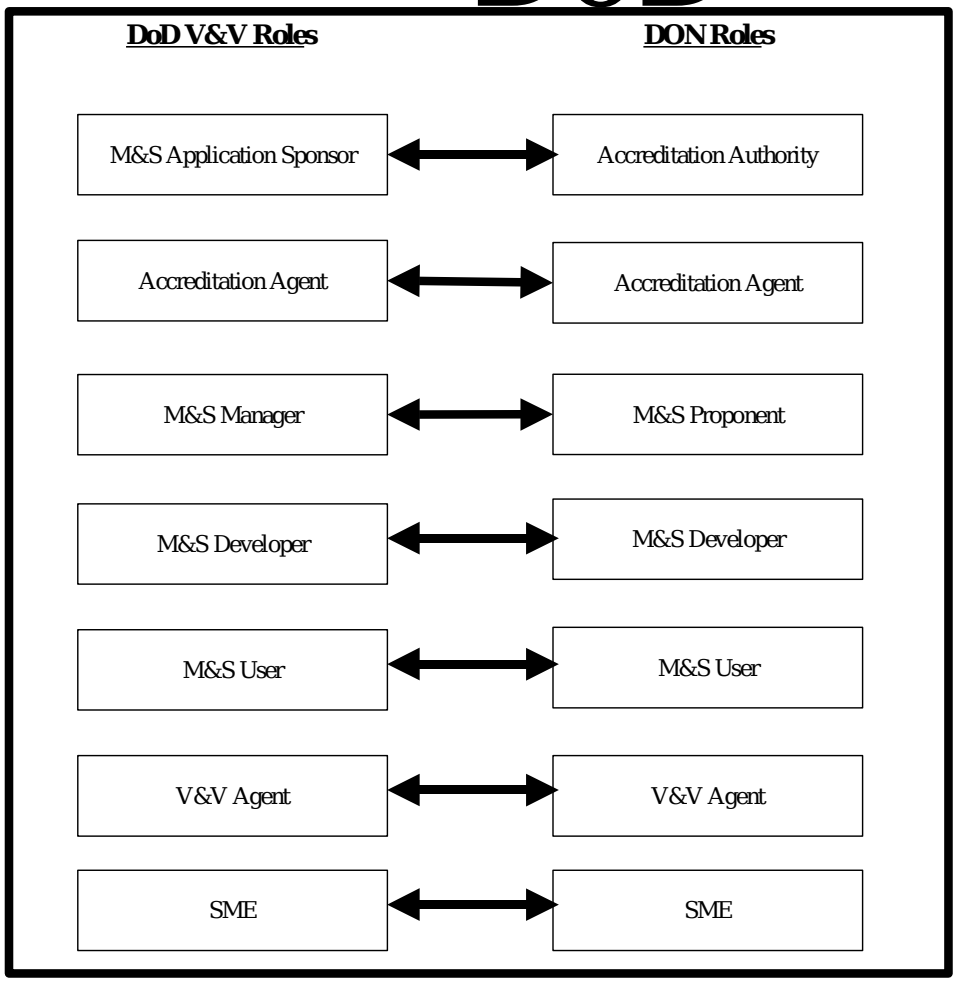

DON VV&A Program POC

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